co-operate with other educational bodies. In moving "That the new regulations for Woolwich examinations will not be satisfactory unless the number of subjects a candidate can take up is diminished by at least one, and that a heavy one, below the present number," the Rev. Dr. James said the Army curriculum afforded no education at all. It was, from the literary point of view, a failure, and from the scientific point of view was poor and inadequate. The incessant and irritating changes were a grave detriment to the intellectual development of the candidates. The result of these changes was especially felt in the department of science, and it was made impossible to give a really valuable scientific training. Under the old system nine was the maximum number of subjects. Now a boy was to be allowed to take up ten subjects, and the amount of mathematics in Class I. had been very largely increased, while a third alternative subject had been added which was beyond the reading required by the scholarship standard for mathematics at the Universities. Dr. James's resolution fell through, but the following were adopted in its place:—(1) That the new regulations for Woolwich examinations involve a disastrous increase of the burden of a curriculum which is already too heavy for candidates of the required age. (2) That it is not desirable that any such changes as are proposed should be made in regulations which have been only recently established, and which have enabled Woolwich and Sandhurst candidates to be generally prepared together, and that the committee be instructed to urge the views of the conference on the military authorities.

SCIENTIFIC SERIALS.

American Journal of Science, December.—*Archelon Ischyros*, a new gigantic Cryptodire Testudinate from the Fort Pierre Cretaceous of South Dakota, by G. R. Wieland. This testudinate is closely allied to the genus Protostega. All the large bones were found in place, and the skeleton was almost complete. The ribs, which average 1 m. in length, are remarkable for their distal increase in thickness. The cervical centra are very heavy and strong bodies, and indicate a neck of enormous strength. The humerus measures ·65 m., the ulna ·33 m., and the femur ·46 m. The total length is about 11 feet 4 inches, and the spread of the massive forearms 16 or 20 feet, this being the most striking feature of the animal. The skeleton was found embedded at the side of a small ravine near the South Fork of the Cheyenne River.—A method for the separation of aluminium from iron, by F. A. Gooch and F. S. Havens. The method is based upon the different solubilities of aluminium and ferric chlorides in strong hydrochloric acid. To test the method, measured portions of the standardised solution of aluminium chloride were evaporated nearly to dryness in a platinum dish, a measured amount of ferric chloride was added in a very little water, a mixture of equal proportions of ether and strong hydrochloric acid was introduced, the liquid was saturated at 15° with gaseous hydrochloric acid, more ether was added to secure complete miscibility, and more gas passed to perfect saturation. The aluminium chloride was collected upon asbestos in a perforated crucible, washed with a mixture of ether and aqueous HCl thoroughly saturated with the gaseous acid, dried at 150° C. for half an hour, covered with pure mercuric oxide, and ignited, gently at first, and finally over the blast. The error was less than 1 per cent.—Chemical composition of Hawaiian soils and of the rocks from which they have been derived, by A. B. Lyons. The relation in chemical composition of soils to the rocks from which they are derived can be most advantageously studied in a volcanic country, where disintegration of the rock is rapid and is attended with great chemical changes. In the Hawaiian soil there is observed a loss of more than half the silica, 77 per cent. of the manganese, 93 per cent. of the lime, 91 per cent. of the magnesia, and about 50 per cent. of the phosphoric acid. It is especially interesting to note that while the rotted lava has lost nearly all its calcium and potassium, the soil retains a considerable proportion of both these elements, probably owing to the influence of plants and molluscous animals.—The Jurassic formation on the Atlantic coast, by O. C. Marsh. Adduces reasons why certain fresh-water formations in New Jersey and elsewhere along the Altantic coast should be regarded as Jurassic instead of Cretaceous.

Bulletin of the American Mathematical Society, vol. iii No. 2, November.—The number opens with a report of the Buffalo Colloquium, a meeting which was held as auxiliary to the ummer meeting of the Society. It lasted a week, and the plan of it was that two courses of lectures should be given, consisting in each case of six one to two-hour lectures. Prof. Bôcher's subject was linear differential equations and their applications, and Prof. Pierpont's the Galois theory of equations. Outlines of the lectures are given. The result was so satisfactory that at the close of the Colloquium a motion was adopted recommending to the Council that arrangements be made for a similar gathering in connection with the next summer meeting of the Society.—A geometrical method for the treatment of uniform convergence and certain double limits, by Prof. Osgood, was read, as previously noted, at the summer meeting. It is a very thorough paper and fully illustrated. The geometrical representation of functions by curves and surfaces is, the author states, of twofold importance; for not only does it represent to the eye, by means of a concrete picture, relations which would otherwise appear only in abstract arithmetic form, but this picture in its turn makes evident new facts, and points out at the same time the curve that the arithmetic proof of the theories thus suggested would naturally take.—Prof. Bôcher reviews Heffter's einleitung in die Theorie der linearen Differentialgleichungen mit einer unabhängigen variabeln.—From the notes we learn that Profs. Klein and J. J. Thomson addressed the Society on October 17.

Symons's Monthly Meteorological Magazine, December.—Weather in the last century. Early records of the weather being somewhat rare, it was thought that summaries of the one in question were worthy of publication. The register was kept at Richmond by Mr. George Smith, a Proctor to Queen Anne, and contains a record of daily observations, made without instruments, from April 1713 to June 1745. The original document is preserved in the library of the Royal Meteorological Society.—The scientific use of kites, by W. L. Moore, Chief of the U.S. Weather Bureau. The question discussed is simply, why kites are better than captive or unmanned balloons for exploring the upper air. The advantages over captive balloons are manifest. Prof. Moore has made out a strong case in favour of kites, but thinks that balloon observations should not be neglected.—*Barometri descriptio*, by J. Addison, 1672–1719. Attention has been called by Mr. Inwards, late President of the Royal Meteorological Society, to a poem under this title which is contained in *Tickell's Addison*, vol. vi. p. 427. The poem is reprinted in the current number of the *Magazine*, and the editor would be glad of a reference to any good translation that may exist.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 10.—"The Chemical and Physiological Reactions of certain Synthesised Proteid-like Substances. Preliminary Communication." By Dr. John W. Pickering.

From the observations recorded in this paper it appears that if certain derivatives of proteids, and other substances of allied chemical constitution, are heated together in sealed tubes with an excess of either phosphorus pentachloride or pentoxide, a series of colloidal substances are formed which, when freed from the contaminating phosphoric acid, and dissolved in concentrated ammonia, give opalescent solutions that, on evaporation down *in vacuo*, yield substances closely resembling in physical, chemical, and physiological properties certain proteids.

These colloidal substances, although they differ from one another in minor details, are usually distinguished by the following characteristics:—

(1) They are soluble in warm water, forming opalescent lævorotatory solutions.

(2) The resulting solutions yield the principal colour reactions hitherto deemed diagnostic of proteids.

(3) In the absence of salts, solutions of these colloids do not coagulate on heating. In the presence of a trace of a neutral salt they coagulate on heating at temperatures very similar to proteid solutions.

(4) Fractional heat coagulation shows the colloidal solutions are a mixture of different substances.

(5) The different constituents of the colloidal solution exhibit different physiological action.

(6) In the presence of an excess of neutral salts, or of salts of the heavy metals, the colloidal solutions behave in a manner similar to proteid solutions.

(7) When introduced into the circulation of pigmented

rabbits, dogs, and cats, certain of these substances (viz. the colloids designated A, B, C, α and β) produce intravascular coagulation of the blood in a manner similar to a nucleo-proteid. They also hasten the coagulability of the blood withdrawn from the carotid, and will, when slowly injected intravenously in minute quantities into dogs, produce a retardation of the coagulability of the intravascular blood, *e.g.* a "negative phase."

(8) Apparently these colloidal substances are owing to both their physical and chemical properties and their physiological behaviour, the nearest synthesised bodies at present known to proteids.

"An Attempt to determine the Adiabatic Relations of Ethyl Oxide." By Dr. E. P. Perman, Prof. W. Ramsay, F.R.S., and J. Rose-Innes, M.A., B.Sc.

Geological Society, December 2.—Dr. Henry Hicks, F.R.S., President, in the chair.—The Secretary announced that Mr. Frank Owen had presented to the Society a photographic portrait of his late grandfather, Sir Richard Owen.—Another possible cause of the glacial epoch, by Prof. Edward Hull, F.R.S. In the introductory portion of the paper the author gave an account of the submarine topography of the area east of North America, and summarised Dr. J. W. Spencer's work upon a submerged Antillean continent; he then dealt with the effects which would be produced upon the Gulf Stream by the uprising of this continent in the glacial period, and maintains that, as the current could not pass into the Gulf of Mexico (being debarred by a coast of high continental land), it would flow directly northwards into the North Atlantic, and thereby be deprived of about 10° (Fahr.) of heat: the effects of which may be practically illustrated by supposing the isothermal line of 32° to take the place of that of 42° in the northern hemisphere. He argued that the increased snowfall which would thus be caused over certain areas would tend to intensify the cold through all the adjoining tracts. To the effects produced in this way must be added those due to the elevation of the land of Eastern North America and to an elevation of North-western Europe, which was supposed to have occurred at the end of Pliocene times. These elevations would intensify the glaciation caused by the difference of direction taken by the Gulf Stream. In the discussion which followed, the Rev. Edwin Hill inquired what were the grounds for the estimated reduction of temperature, and asked for a comparison between the Gulf Stream in such conditions and the present North Pacific current. Dr. Blanford agreed with him in feeling doubtful whether a change in the configuration of the American coast would prevent a warm current from still impinging upon the shores of North-western Europe, and expressed the opinion that the main cause of the glacial epoch was still unknown.—On the affinities of the Echinothuridæ, and on *Pedinothuria* and *Elikodiadema*, two new subgenera of Echinoidea, by Dr. J. W. Gregory. The author summarised and discussed the literature bearing upon the Echinothuridæ, and brought forward arguments to prove that the family is a member of the order Diademoidea, and is derived from the Pedinidæ, members of which are found in earlier rocks than the Corallian, which contains the oldest member of the Echinothuridæ, namely, *Pelanechinus*. He maintained that the extreme flexibility and loose articulation of the plates of the living genera *Asthenosoma* and *Phormosoma* was due to the diminished calcification of the plates, and that these recent genera were extremely specialised forms, and not primitive—the apparently primitive features of the family being secondarily acquired, not primæval.—On *Echinocystis* and *Palæodiscus*, two Silurian genera of Echinoidea, by Dr. J. W. Gregory. The author gave a history of the genera *Echinocystis*, Salter, and *Palæodiscus*, Wyv. Thoms., redescribed their structures, and discussed their affinities. He concluded that *Echinocystis* was an echinid and not a cystid; and that *Palæodiscus* was an echinid and not an asterid.

Linnean Society, December 3.—Mr. C. B. Clarke, F.R.S., Vice-President, in the chair.—Mr. R. Morton Middleton exhibited and made remarks on specimens of *Acer dasycarpum* strangulated by *Aristolochia tomentosa*. He also exhibited examples of *Helix Cumberlandiana*, an extremely local land mollusc from the carboniferous limestone of Tennessee, his remarks being confirmed by Mr. W. Stearm, an American conchologist, who was present as a visitor.—Mr. E. M. Holmes exhibited specimens of *Liebmannia major*, a seaweed not hitherto detected in Britain, and, so far as is known, recorded only from Finisterre. The specimens were collected at Lossiemouth in August 1896. He also showed *Bonnemaisonia hamifera*, collected in May last by Mr. E. George, and in August last by himself. In 1895 living specimens of this seaweed, a native of Japan, were found at Falmouth by the late Mr. T. H. Buffham, and during the present year other examples had been found at Shanklin, Isle of Wight, showing that the plant had apparently become naturalised. The Rev. George Henslow gave the substance of a paper entitled, "Does Natural Selection play any part in the origin of Species among Plants?" After defining a species from the systematists' point of view, the author showed, by examples, that many specific characters in plants might be useful, indifferent, useless or injurious; and that they were the direct result of a responsive action especially to the physical environment. The *origination* of varietal characters, he thought, should be considered as quite distinct from "the survival of the fittest" and "the struggle for life" which determine the *distribution* of species in time and space. The individual differences of plants were held to be (as a rule) inadequate to produce variations of any systematic value, unless the plant migrated, and dimensions *per se* could have no "destructive" capacities whatever. Darwin's and Wallace's conditions for natural selection, viz. large populations and infertility between parents and offspring, had, he considered, no connection with the origination of variations, while the latter did not exist. On the contrary, species with large populations were (as a rule) invariable, while others might vary greatly, but only when in different soils, &c. Instead of "changed conditions of life" happening to any plant without migration, it was the latter which brought them about; instead of a struggle being required with the parent stock or other plants, it was the avoidance of the deteriorating effects of struggling which was most beneficial, and new varieties arise best when there was no struggle at all.

Anthropological Institute, December 8.—Mr. E. W. Brabrook, President, in the chair.—Prof. E. B. Tylor read a paper by Mr. Horatio Hale on four historical Huron wampum-belts, which he exhibited, adding remarks of his own on the employment of wampum in a mnemonic system. After a short account of the state of the Indian confederacies at the time of the arrival of the earliest discoverers, in the course of which the mention of the chief Hiawatha caused Prof. Tylor to contrast the accuracy of Fenimore Cooper as a painter of Indian life with the poetical license of Longfellow, attention was directed to the use of wampum as currency, and to the laborious method of drilling the hard shell to form the beads. Specimens of the two shells employed in the manufacture were exhibited. Dr. Tylor then passed to the symbolic use of wampum-belts as historical records, illustrating his remarks by a number of lantern slides. From these it was explained how the Iroquois belt might be distinguished from others by the occurrence of diagonal bands of beads, contrasting in colour with those forming the ground. These bands are derived from the diagonal rafters of the peculiar "long-houses" of the Iroquois. Other well-known conventional symbols, representing hearts, houses, lands, the "peace path," &c., were also illustrated. One of the belts exhibited was itself an historical record of some interest to Europeans, as it depicts a proposal of conversion to Christianity made by the early Jesuit missionaries to the Indians, the message being effected by working into a wampum-belt a symbolic group consisting of the lamb, the dove, and several crosses. The investigations made by Mr. Hale seem to show that the "Penn Belt," which is now in New England, is not a record of the famous scene depicted by Benjamin West, but of a more obscure treaty concluded with Iroquois chiefs. The intrinsic evidence afforded by the belt convinces Mr. Hale that it was made by Iroquois. In this way anthropology has been able to correct history. Dr. Tylor exhibited lantern slides of West's picture, and of one of Lafitau's plates, the latter giving a far more accurate idea of the ceremonious ratification of an Indian treaty than the former. He also exhibited a slide illustrating the use of wampum-belts as records in modern times, exemplified by the annual meeting of chiefs, at which all the belts are carefully gone over, in order that events of tribal importance may be kept green. A short discussion followed.

Mathematical Society, December 10.—Prof. Elliott, F.R.S., President, in the chair.—Major MacMahon, R.A., F.R.S., stated a result arrived at in a note by Prof. Sylvester, F.R.S., on a discovery in the theory of denumeration. In connection with this communication the President announced that

Prof. Sylvester had put his "Outline of Lectures on the Partitions of Numbers," which he read at King's College, London, in 1859, and which had never been published, at the disposal of the Council, and that that body had arranged to print them as a companion to the ex-President's valedictory address.—Mr. Burbury, F.R.S., communicated a paper on the stationary motion of a system of equal elastic spheres of finite diameter.—Mr. Hough read a paper on the influence of viscosity on waves and currents.—Mr. Macfarlane Gray gave a description of his multiplying apparatus. Messrs. C. V. Boys, F.R.S., and T. I. Dewar, Prof. Greenhill, F.R.S., and other gentlemen, joined in a discussion of points connected with the subject.—Lieut.-Colonel Cunningham, R.E., gave an account of results arrived at in his paper on the connection of quadratic forms.—The following papers were communicated by their titles, viz.: Concerning the abstract groups of order K ! and $\frac{1}{2}$K ! holoedically isomorphic with the symmetric and the alternating substitution groups on K letters, by Prof. E. H. Moore.—On a series of co-trinodal quartics, by Messrs. H. M. Taylor and W. H. Blythe.—On finite variations, by Mr. E. P. Culverwell.

Zoological Society, December 15.—Lieut.-Colonel H. H. Godwin-Austen, F.R.S., Vice-President, in the chair.—The Secretary read a report on the additions that had been made to the Society's menagerie during the month of November 1896.—Mr. Sclater exhibited two bound volumes of original drawings by Joseph Wolf and Waterhouse Hawkins, belonging to the Knowsley library, which had been kindly lent to him for examination by the Earl of Derby. They represented various animals that had been living in the Knowsley menagerie, 1844–48.—Mr. W. Bateson exhibited and made remarks on some pigeons with very well-marked webs between the toes.——Prof. Newton sent for exhibition the type-specimen of *Heterorhynchus olivaceus* of Lafresnaye, kindly entrusted to him by Prof. Hyatt, Curator of the Museum of the Boston Natural History Society. This extinct species, now referred to *Hemignathus lucidus* of Lichtenstein, was peculiar to Oahu, one of the Sandwich Islands, and the present appeared to be the only full-plumaged male specimen ever seen in this country.—Dr. G. Herbert Fowler read a paper entitled "Contributions to our Knowledge of the Plankton of the Færoe Channel," which contained an account of the first results arrived at from his examination of the marine fauna of this channel during a voyage in it, in July and August last, in H.M.S. *Research* (Captain Moore).—The Secretary read a paper by Mr. Oldfield Thomas, entitled "On the Genera of Rodents, being an attempt to bring up to date the current arrangement of the Order." Taking as a basis Alston's paper on the Rodents, published in 1876, the main object of the present communication was to place in their proper positions the many genera described since that author's times. In regard to the larger groups, Alston arrangement had been followed as far as possible; but among other things it had been thought better to elevate the subfamily Bathyerginæ into a family, to make two families of the Hystricidæ, one for the Old-World and one for the New-World porcupines, and to give to the subfamilies Geomyinæ and Heteromninæ full family rank. All the recent genera of the order were enumerated, to the number of 158, as compared with 100 in Alston's list.—Dr. J. W. Gregory gave a description of *Lysechinus*, a new genus of Plesiocidarids from the Tyrolese Trias.—A second paper by Dr. J. W. Gregory related to the classification of the Palæozoic Ophiurids.—A communication was read from the Rev. O. Pickard Cambridge, F.R.S., containing descriptions of four new or little known spiders (Araneidea) from Ceylon, Borneo, and South America.—A communication from Dr. Robert O. Cunningham related to the occurrence of a pair of supernumerary bones in the skull of a Lemur, and to a peculiarity which he had noted in the skull of a young Orang.—A communication was read from Dr. Alph. Dubois, in which he gave the description of a new African Trogan from Lake Tanganyika, proposed to be named *Hapaloderma rufiventris*.

EDINBURGH.

Royal Society, December 7.—The first ordinary meeting of the Society was held, at which Prof. M'Kendrick gave the opening address. He remarked that the number of ordinary Fellows of the Society was now 513, twenty-five having been elected during the past year. Referring to the jubilee of Lord Kelvin, he said the celebrations were unique in their kind, and marked the climax, though not the end of a great career. It was now fifty years since Lord Kelvin became a member of this Society, and during that time he had contributed seventy-two papers, including his famous memoirs on thermodynamics, on the dissipation of energy, and on vortex motion. Prof. M'Kendrick then read short obituary notices of Fellows who had died during the recess. By request of the Council, he then gave an account of recent investigations of his own. He began with some remarks on the structural and physiological nervous unit. He showed that these units in brain structure—neurons, as they were called—were not, as was at one time believed, linked together. There was contiguity of their fine terminations, but not continuity of structure. He next described how it was possible by an arrangement consisting of a variable resistance transmitter, and an induction coil, to stimulate the sensory nerves of the skin electrically, so that some of the elements in music—rhythm and intensity—might be perceived, and even enjoyed by those who had become deaf. Lastly he exhibited his improved phonographic recorder, by which the curves on the cylinder could be amplified so that the form of each might be studied, and made some remarks on the character of these curves.—Papers by Mr. G. R. M. Murray on the reproduction of some marine diatoms, and by Dr. Thomas Muir on the eliminant of a set of quaternary quadrics, on the resolution of circulants into rational factors, and on the eliminant of $f(x) = 0, f(1/x) = 0$, were held as read.

DUBLIN.

Royal Dublin Society, November 18.—Prof. A. C. Haddon in the chair.—The following papers were presented:—Note on Irish annelids in the Museum of Science and Art, Dublin, by Prof. W. C. M'Intosh; new species of dragon-flies in the Dublin Science and Art Museum, by Mr. George H. Carpenter; on Fresnel's wave-surface, and the surfaces relative thereto, by William Booth, Principal of Hoogly College, Bengal (communicated by Mr. Thomas Preston).—Prof. W. J. Sollas, F.R.S., gave an account of a journey in the interior of Fiji, illustrated by numerous photographs.

NEW YORK.

National Academy of Sciences, November 17 and 18.—Prof. Ogden N. Rood read a paper on flicker photometers. He called attention to a paper published by him in the *American Journal of Science* for September 1893, on a photometric method which is independent of colour, illustrating its use by determinations of the luminosity of discs of variously coloured paper. In his communication to the Academy, he described five forms of photometer based on the flicker principle. The idea underlying the action of these instruments is identical with that which obtained in his experiments with coloured discs, viz. the rapid distribution of two illuminated surfaces alternately for each other, the flicker disappearing when the two surfaces had equal brightness. The photometric measurements made with this new style of photometer are quite accurate and independent of colour.—Prof. Edward D. Cope read a paper on the geographical distribution of batrachia and reptilia in the Medicolumbian region.—Prof. A. E. Verrill read a paper on the evolution and phylogeny of the gasteropod molluscs, illustrated by beautiful diagrams. He advances the view that the Ophisthobranch molluscs were evolved from Pteropods, and are a type of higher order than the Prosobranchs, notwithstanding that they are hermaphrodites. Their sexual organs are much more complicated, and the loss or thinness of the shell gives greater scope for the development and arrangement of internal organs than can be attained by the Prosobranchs with their hard shells. The Ophisthobranchs furnish the most conspicuous examples in the animal kingdom of protection by mimicry, having lost their hard shell as a means of protection, though they still retain it in the early stages of life. The adults, however, either mimic seaweeds, on which they live, or sponges, hydroids, or corals. known to be poisonous to fishes, the chief enemies of the molluscs. Some beautiful examples were shown of molluscs, living in the Sargasso Sea, which imitate the seaweed, and even the parasitic life upon it. In the discussion, Prof. Cope maintained the correctness of the old theory that the Prosobranchs were the more advanced and higher.—Prof. Othniel C. Marsh read a paper on the Jurassic formation on the Atlantic coast. This formation has long been supposed to be lacking in America; but Prof. Marsh found it in 1868, near Lake Como in Wyoming, and has now traced it also on the Atlantic coast.—Prof. Alfred M. Mayer read a paper on the equation of the forces acting in the flotation of discs and rings of metal on water and on other liquids, giving several formulæ. The surface tension of pure water is sufficient to bear up discs or rings of metal for three days in localities free from dust, but the slightest impurity in water destroys the surface tension; even dipping the finger into it, or pouring vapour of ether upon it. Could the water be kept absolutely free from dust, it seems probable that it would retain its surface tension indefinitely. The surface tension of mercury is about ten times as great as that of water, but it overflows the metal, and is not convenient to experiment with. The kind of metal used in these experiments is quite immaterial.—Prof. Simon Newcomb read two papers, one on the physical causes of the variations of latitude. These causes are accumulation of ice and snow, and the alternate northerly and southerly motion of the earth's atmosphere from and towards the poles for a period of three months in one direction, and three months in the other direction in each year. His second paper was on solar motion as a gauge of stellar distances. He finds that the stars observed have an apparent drift southward of about 2″ a year, indicating that the solar system is moving at that rate in the direction of Alpha Lyræ. His observations show, also, that the stars of smaller magnitudes are not so remote from the earth as their magnitude would indicate, the increase of distance being about one-fifth for each decrease in stellar magnitude. This seems to warrant the inference, he thinks that the visible universe has a definite limit in space.—Prof. C. S. Hastings read a paper on a new type of telescope free from secondary colour. He finds it possible, by proper arrangement of silicate glasses, to eliminate secondary colour entirely, and also to reduce the length of the telescope tube one half, obviously giving a great advantage in the construction of large telescopes where the weight of the object-glasses has to be supported at a great distance from the point of support.—Prof. Ira Remsen read two papers: one on the hydrolysis of acid amides; the other on the isomeric chlorides of paranitro-orthosulphobenzoic acid.—Prof. C. S. Peirce read two papers: one on a graphical method of logic; the other on mathematical infinity.

PARIS.

Academy of Sciences, December 14.—M. A. Cornu in the chair.—On a new form of the equations to the problem of three bodies, by M. H. Poincaré.—On a class of transcendental functions, by M. Émile Picard.—The theory of the confluence of lymphatics and the development of the lymphatic ganglions, by M. L. Ranvier.—The application of the Röntgen rays to pulmonary tuberculosis, by M. C. H. Bouchard. The continuation of the study of one of the cases of pleurisy previously described shewed an opacity at the summit of the lung, appearing to result from a condensation of the pulmonary tissue, and this was confirmed by percussion and auscultation. In all the cases of tuberculosis examined with the aid of the fluorescent screen, the number of pulmonary lesions has been clearly made out, and in all diseases of the thorax the application of this method forms a valuable aid to diagnosis.—On the third scientific campaign of the *Princess Alice*, by S. A. Albert I., Prince of Monaco. This communication is chiefly occupied with the results of deep-sea soundings in the neighbourhood of the Azores, and in the Mediterranean.—A new double image micrometer, particularly suitable for the measurement of small diameters, by M. G. Bigourdan.—On Taylor's series, by M. Emile Borel.—On a linear partial differential equation of the second order, by M. J. Le Roux.—On the quadratic integrals of the equations of dynamics, by M. G. di Pirro.—On the longitudinal tension of the kathode rays, by M. Colard. Starting with the hypotheses that the ray consists of the transport of negatively charged molecules, and that the electric field is negligible in the space considered, the conclusion is drawn that the behaviour of a kathode ray in a magnetic field is similar to that of a perfectly flexible conductor carrying the same current.—On some errors admitted as facts in electromagnetism, by M. Vaschy. In the case of the movement of a magnet under the influence of a current of constant intensity, the usual calculation of their relative energy neglects the heat evolved by the current. Other examples are given of similar cases.—On selenic anhydride, by M. René Metzner. A comparison of the thermochemical data of sulphuric and selenic acids; the formation of selenic anhydride from selenious anhydride and oxygen is an endothermic reaction.—Analysis of copper by the electrolytic method: estimations of arsenic, antimony, sulphur, and foreign metals, by M. A. Hollard. A continuation of a previous paper on the same subject.—On the antimonio-tungstic combinations, by M. L. A. Hallopean.—Researches on the sulphides of cobalt and nickel, by M. G. Chesneau. The solubility of cobalt sulphide in sodium polysulphide increases rapidly with the excess of sulphur present. The sulphide of cobalt obtained in this way approximated to the composition $CO_2.S_7$. Nickel gives with the same reagent a black polysulphide of perhaps analogous composition, differing from the cobalt salt in being soluble with difficulty in sodium polysulphide, and more soluble in the monosulphide.—New method for the estimation of glycerol, by MM. F. Bordas and Sig. de Raczkowski.—On 1 : 3 di-bromo-propylene, by M. R. Lespieau. This substance ($CHBr : CH.CH_2.Br$) is obtained by the action of phosphoric anhydride upon symmetrical dibromhydrin.—On the decolorisation in wines, by M. J. Laborde. Under the action of the oxydase present in a culture of *Botrytis cinerea*, a wine was completely decolorised in four hours. This oxydase is destroyed by heat, hence the best method of preventing the spontaneous decolorisation of wines is to raise the wine to a temperature sufficiently high to destroy the ferment.—Coagulating and toxic properties of the liver, by MM. Mairet and Vires. By the action of heat upon the extracts a precipitate is formed, possessing coagulating properties; the filtrate contains the toxic principles.—Replacement of the amibocytes and phagocytic organ in the *Paludina vivipara*, by M. L. Cuénot.—On the development of Annelids, by M. Auguste Michel.—Contributions to the study of the *Rouget*, by M. S. Jourdain. The disease known as "rouget," "bête rouge," &c., is due to the attack of an acarus (*Trombidion*), in a larval hexapodal form.—On the formation of non-nitrogenous food stores in the nut and almond, by M. Leclerc du Sablon.—Action of some substances on the germination of the spores of black rot, by MM. L. Ravaz and G. Gouirand.—On an apparatus designed to show that the quantity of dissolved gas in sea-water at great depths is independent of the pressure, by M. Jules Richard. A description, with diagrams, of the apparatus used in the deep-sea soundings on the last voyage of the *Princess Alice*.—On the influence of certain living organisms on the quantities of oxygen and carbonic acid dissolved in sea-water, by M. Marten Knudsen. The observations on the amount of dissolved oxygen in the superficial layers made by Dittmar, in the *Challenger* Expedition, and later by Tornoë, show great variations, the quantities found being in some cases greater than that calculated from the law of solubility of gases. These results were attributed by Dittmar to errors of observations, but similar results having been obtained during the expeditions of the *Ingolf* to Greenland, although by a different method from those adopted by other observers, led to the discovery that this excess was due to the presence of a great number of living copepods.—On a red rain that fell at Bizerte (Tunis), by M. Ginestous. The colouring matter was of a mineral nature, which from its composition would appear to consist of the débris of a granulitic pegmatite.—The cooling of the globe, the primordial cause of evolution, by M. R. Quinton.

NEW SOUTH WALES.

Linnean Society, October 28.—Mr. Henry Deane, President, in the chair.—The President formally announced the death, on the 10th inst., of Baron von Mueller, who was one of the first two honorary members of the Society to be elected (January 22, 1876).—On the motion of Mr. J. H. Maiden it was resolved that (1) the members of this Society desire to express the profound regret with which the tidings of the decease of Baron von Mueller have been received; and at the same time to place on record their high appreciation of the Baron's life-work, which has in so eminent a degree contributed to the advanced state of our knowledge of the flora of Australia. (2) A copy of this resolution be forwarded to the surviving sister of the late Baron, with an expression of the Society's sympathy in her bereavement.—The President read a letter from the Royal Society of Tasmania, offering to co-operate in any movement to raise some appropriate memorial of the late Baron von Mueller.—The following papers were read:—Australian *Termitidæ* (Part ii.), by Walter W. Froggatt. The author discusses the classification of the family, and proposes its subdivision into four subfamilies based upon the characters of the neuration of the wings.—Note on the occurrence of Palæozoic *Radiolaria* in New South Wales, by Prof. David. With the exception of the opal rocks, which contain numerous spherical casts, possibly of radiolaria, all radiolarian rocks at present known in New South Wales are of Palæozoic age, and occur on two geological horizons, namely, Carboniferous (? or Devonian), as in the red jaspers of Barraba and Bingera, and the claystones and cherts, &c., of Tamworth; and Devonian or Silurian as at Jenolan Caves, in which locality the radiolaria are best preserved where the rocks are in contact with eruptive dykes. The author is led to the conclusion that these radiolarian rocks are not necessarily of deep-sea origin. In Palæozoic times in New South Wales the development of radiolaria both vertical and horizontally was very extensive.—Note on traces of *Radiolaria* in pre-Cambrian rocks near Adelaide, by Prof. David and Walter Howchin. The recent microscopic examination of calcareous and cherty rocks of undoubtedly pre-Cambrian age from South Australia has shown that these rocks, not previously known to be ossiliferous, contain abundant remains of radiolaria.

AMSTERDAM.

Royal Academy of Sciences, October 31.—Prof. van de Sande Bakhuyzen in the chair.—Prof. W. Kapteyn on the construction of a curve of the third order, its real foci, its satellite-point and a tangent being given.—Prof. van der Waals demonstrated that the value of b in the equation of fluids which, when they are in a state of great rarefaction, is equal to four times the molecular volume, decreases with diminishing volume. The formula

$$b = 4m \left\{ 1 - \epsilon_1 \left(\frac{4m}{V}\right) + \epsilon_2 \left(\frac{4m}{V}\right)^2 \&c. \right\}$$

represents the variation of b with the volume. Of the coefficients ϵ_1, ϵ_2, &c., only the first has been calculated, and has been found equal to $\frac{17}{32}$.—Prof. Weber communicated the conclusions drawn from 254 determinations of the absolute and the relative weight of the brains of mammals. A hippopotamus amphibius of 1755 kilogr. had brains weighing only 582 gr. Consequently the ratio is 1 : 3105. This is the most unfavourable one hitherto fixed by weighing. Only the relative weight of the brains of the large cetacea presents a more unfavourable ratio, which, however, is founded on estimation. In many respects the hippopotamus has preserved the character presented by the brains of the tertiary mammals.—Prof. Franchimont on the fusing point of organic bodies. The speaker drew attention to the variation of the fusing point taking place when hydrogen atoms are replaced by other elements or groups of atoms, and took it that the latter, though they become united with the same atom, do not occupy the same place, so that a change in the form of the molecule is brought about, which influences the fusing point. This change of form counteracts in some cases the effect of the increase of the molecular weight, which consists in a rise of the melting point, and seems to be brought about principally by the CH_3 group, which, when in contact with oxygen, nitrogen, or carbon, can cause the fusing point to fall. To such a change of form the speaker also wished to ascribe the phenomenon observed by himself and Zincke in 1872, viz. a variation of the fusing point in terms of an homologous series with an even and an odd number of C atoms alternately. The speaker had met with this phenomenon in other cases also.—Prof. Engelmann treated of myogenic self-regulation of the action of the heart, and presented a paper on the subject for publication in the Academy's *Proceedings*.—Prof. Lorentz presented a paper to be published in the Academy's *Proceedings*, entitled "a universal theorem concerning the motion of a viscous fluid with friction, and a few consequences deduced from it."—Prof. Kamerlingh Onnes communicated two papers: (*a*) by Dr. Zeeman, on the influence of a magnetisation on the nature of the light emitted by a substance. Pursuing a hint given by Faraday, several experiments were tried. The principal was this: the light of the electric arc, being sent through a heated tube containing sodium vapour, is analysed by a Rowland's grating. The tube is placed between the poles of an electro-magnet. When acted on by the magnet, a slight broadening of the two sodium lines is seen, tending to show that forced vibrations are produced in the atoms by the action of magnetism; (*b*) by Dr. J. Verschaffelt, on capillary ascent between two concentric cylindrical tubes, being measurements carried out in the Leyden Physical Laboratory. In a previous communication Mr. Verschaffelt, to calculate the capillary ascent of liquid carbonic acid, made use of an hypothesis, viz. that the meridian section of the surface of the liquid was an ellipse. The writer has put this manner of calculation to the test of observation. For this purpose, however, he has not used liquid carbonic acid, but methyl chloride, and has found a satisfactory correspondence to exist between the value deduced from observation and that arrived at by calculation.—Mr. Jan de Vries presented, on behalf of Prof. L. Gegenbauer, of Vienna, a paper entitled "Zwei allgemeine Sätze über Sturm'sche Ketten."

GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (mathematico-physical section, Part 3) contains the following memoirs recently communicated to the Society.

August 1.—Charles A. Noble (San Francisco): Solution of the boundary equation for a plane contour composed of segments of continuous curvature and without salient angles. R. Fricke (Brunswick): On a simple group of 360 operations. W. Voigt: An attempt to determine the true specific electric moment of a tourmaline.

October 24.—J. Orth: (1) On the formation of fibrin on serous and mucous membranes; (2) Researches conducted in the Göttingen Pathological Institute. W. Voigt: (1) A new method of investigating the thermal conductivity of crystals; (2) On the position of the absorption-brushes in biaxial pleochroic crystals. The formal communications (Part 2) include the address voted to Lord Kelvin upon his recent jubilee, and that to Prof. Wilhelm Hittorf, of Münster, on his *doctorjubiläum*.

BOOKS AND SERIALS RECEIVED.

BOOKS.—A Treatise on Ore Deposits: J. A. Phillips, 2nd edition, by Prof. Louis (Macmillan).—Mensuration for Beginners: F. H. Stevens (Macmillan).—Applied Bacteriology: T. H. Pearmain and C. G. Moor (Baillière).—The Story of Forest and Stream: J. Rodway (Newnes).—Scritti intorno alla Teoria Molecolare ed Atomica ed Alla Notazione Chimica: S. Cannizzaro (Palermo).—The Lepidoptera of the British Islands: C. G. Barrett, Vol. 3 (L. Reeve).—This Wonderful Universe: A. Giberne (S P.C.K.).—Elementary Meteorology: Dr. F. Waldo (New York, American Book Company).—Observations and Researches made at the Hong Kong Observatory, 1895: W. Doberck (Hong Kong).—La Structure du Protoplasma et les Théories sur l'Hérédité, &c.: Prof. Y. Delage (Paris, Reinwald).—Traité de Zoologie Concrète, Tome 1: La Cellule et les Protozoaires: Prof. Y. Delage and E. Hérouard (Paris, Reinwald).

SERIALS.—Good Words. January (Isbister).—Sunday Magazine, January (Isbister).—American Naturalist, December (Philadelphia).—Himmel und Erde, December (Berlin).

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